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THE COMPLEXITY OF RHYTHM IN DECORATIVE ART

By GLADYS A. REICHARD

INTRODUCTION

IN PRIMITIVE art we frequently find such complex units that the motive of rhythmic repetition is very difficult to discern, in fact it sometimes seems to be entirely absent. But since we find a conception of order or rhythm in music differing from that which we readily recognize, it is quite conceivable that there may be a similar difference in art. In regard to this question Mr. Charles W. Mead of the American Museum of Natural History made a few observations (*Boas Anniversary Volume*, pp. 193–195) on Peruvian textiles and discovered what he called a "six-unit design." He found that the "six-unit" principle holds not only for one-row bands, but also for a larger surface composed of a number of rows. For example, six designs are repeated in the same order on a poncho so that they form six diagonal rows from left to right. From casual observations made of the Peruvian textiles exhibited at the American Museum it appears to the writer that a number of other "rhythm-units" and design combinations could be discovered, some of them exceedingly complex, owing to the extensive use of diagonals and zig-zag patterns, but nevertheless following definite mathematical laws.

Such a development is not surprising, however, when considered in relation to the other achievements of the Peruvians, e.g., the fineness of materials and weaving, the art of dyeing, and the combinations of beautiful colors. The occurrence of such phenomena formulates the question: Do primitive people have a definite plan in carrying out their ideas in beadwork, embroidery and other handicrafts?

The materials used in trying to answer this question are as follows: One hundred and five designs of beadwork and embroidery made by the Thompson River Indians, which were collected by Mr. J. A. Teit; bands of skin in the collections of the American Museum of Natural History used for decoration of fur coats by the natives of Siberia; and Roman stripes on modern ribbons, girdles and silks as observed by the writer whenever occasion permitted. Conferences with Mr. Charles Mead and with Mr. M. D. C. Crawford, one of the editors of *Woman's Wear*, also proved helpful.

The question of rhythmic repetition is, in many cases, a simple one. There is no doubt, for instance, that there is a definite plan in repeating a design or group of designs on a Tlingit basket or on a beaded band from the Plains area. We are accustomed to recognize units of perhaps three or four elements even if no definite space separates them. Furthermore, we notice immediately an attempt at repetition of units consisting of as many as fourteen, fifteen or even more elements if a space is kept between the units, as is the case with the Roman stripes which have been in vogue for a number of years. But if, as happens in many of the Thompson River bead necklaces, the unit consists of a number of elements with no device to separate the units, it is more common to suppose that the rhythmic motive is absent and that the stringing was done aimlessly.

Not only have we discovered the existence of complex units, but we desire to know the reason for their occurrence. Several possibilities suggest themselves: Was the effect the result of chance? Did the artist have a definite design in mind and know that in carrying it out she would produce an aesthetic effect? Or, did she play with her technique and because of the desire for variation secure a satisfying object with no definite picture of the whole in mind as she worked?

In such a discussion it will be necessary to state that by an aesthetic effect we mean that the worker has made an object, which, to her, or to her and her social group, is satisfactory. We could not, for example, say that we consider every color combination used by a South African pleasing, although the effect to him would be perfect. On the other hand, we could not be assured that his taste would approve of many combinations which we would call harmonious. Taste, after all, is a matter of cultivation; the people of Mozart's day did not fancy his music. Many of us have not succeeded in preferring jazz to Mozart, or in transferring our loyalty from the Italian to the Cubist school of painting. Let us then, in this discussion at least, consider the finished product and its beauty only from the point of view of its maker, and, if possible, withhold our own opinion with regard to its aesthetic appeal. We might, for the sake of clearness, substitute the word "satisfying" for "aesthetic" in this connection. Furthermore, let us be prepared, if occasion should demand, to dissociate proceedings which in our minds are commonly related, as for instance the association of design and color. Each may be developed without the slightest regard for the other.

SPECIMENS EXAMINED

Of the 203 sketches collected by Mr. Teit, 105 were sufficiently complex to be of interest in approaching the problem. These include necklaces made by simple bead-stringing, by combining several threads of beads, by looping threads of beads, by stringing beads and fringes, and by embroidering beads on skin; bracelets; dresses trimmed with beads and fringes; stripes on dresses and belts, and fringes on leggings. Besides beads, elæagnus seeds, cactus seeds, and dentalia were used, and sinew and hair serve for fringes. There are often two, three, or more necklaces or stripes of the same style which would indicate that they were made by the same worker. The material at hand gives positive data in the case of only two workers, Sinsintko and her daughter TEkwitlixkEn. These women made the most beautiful of the specimens collected, stripes embroidered in combinations of yellow, blue, black, white, red, and green.

Other examples which furnish data are the embroidered bands made by the Russianized natives of Siberia. The bands are nearly a foot wide and are used as borders of fur coats. They consist of a strip of red felt appliquéd with a zigzag skin design. A stripe joins the felt strip to the wide central portion which is made up of rectilinear design units embroidered on skin with silk floss of many colors. When speaking of the bands we shall refer to this central portion which furnishes some of our conclusions because of the intricacy of its color combinations and application of the design. A second slit-embroidered piece connects it with a stripe of black velvet, ornamented like the red felt band, and the whole is finished by a narrow strip of skin, slit-embroidered and fringed. Four of these bands were examined, only one of which was sewed to a coat so that its position showed the intention of the worker with regard to symmetry. No other bands of the same kind were available but the similarities exhibited in these four leave little doubt as to the purpose of their makers.

It was suggested that observations of modern clothing might prove instructive. Some years ago, for instance, it was fashionable to trim dresses with buttons of various colors, the color-units repeated at such long intervals that a glance did not reveal the motive of repetition. Accordingly, Roman stripes in silks, ribbons, scarfs, etc., were observed. Through the kindness of friends who owned them I was able to examine about a dozen in detail. I noticed nearly a hundred, however, on the street, in subway trains and public conveyances. In every case it was possible to differentiate immediately the unit—sometimes of a large number of elements, sometimes of a few—because the designer had left a definite space of the tone-color between the units. Consequently the data on Roman stripes is disappointing, for the problem is to discover order in supposed chaos and this material leaves no doubt as to the designer's intention.

There occur, on the other hand, two relevant questions How did the complexity of such design originate? How did the innovator get the idea of combining brilliant colors in stripes more or less wide, and how did he determine which colors should be used? The answer to the first question is lost in antiquity. Many very old and valuable shawls and scarfs are known to have come from Italy, but materials with the same principle of decoration come from diverse parts of the world, and their originators are unknown. The latter question provoked a discussion concerning how styles are created, and which ones succeed and why. In this discussion Mr. Crawford emphasized the difficulty in analyzing motives but gave grounds for fruitful speculation founded on his experience in studying women's dress.

DATA PRESENTED BY THE SPECIMENS

Doubtless simple bead stringing offers a very great field for variety. There are not so many restrictions as, for instance, in embroidery or weaving. The embroiderer, like the mural decorator, must consider her space, the adaptation of working materials to the working surface, size, proportion, and the like. Accordingly, to produce a finished article she must have attained a high degree of expertness and consequently nicety of judgment. In stringing beads, however, there is only one dimension, length, to be considered; one bead or so, especially if small, would not greatly affect the appearance of a necklace or bracelet. Hence it should prove easier for a worker to make a symmetrical or rhythmic circle than otherwise. But ease of accomplishment is not always uppermost in the primitive worker's mind, and the results obtained show that other factors determine the appearance of the finished product.

Before describing the specimens two cautions must be given. First, symmetry may be due to the point of view taken. For example, the beading on the front of dress Fig. 14, *b* if counted from center down would be absolutely asymmetrical, but if counted from the bottom up to the center is symmetrical except that two elements (half a unit) are repeated at the meeting-point. Such an occurrence is doubtless due to the fact that the maker began at the bottom on one side and worked toward the center; then she repeated the process on the other side but misjudged her distance and required two more beads to fill the space. It is necessary then to attempt to read the specimens from every possible angle. Second, beads of varying size are strung to fill a given space which does not always require the same number. This fact is demonstrated in eight necklaces of which necklace 6 is an example (two small black beads on one side balance one large black on the other), and must be considered when regularity or symmetry is discussed.

We have considered as a rhythmic unit a combination of motives, either of color or design, which is regularly or symmetrically repeated. Such a unit may consist of any number of elements and varies from two to eighteen or more.

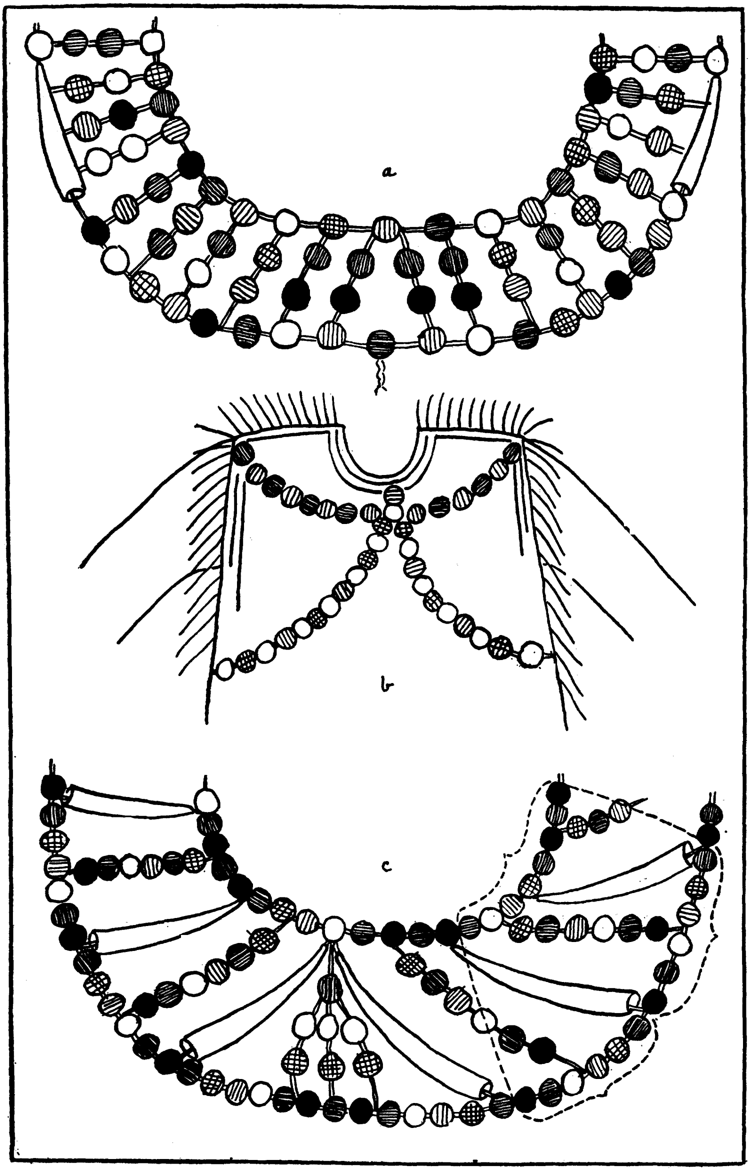

FIG. 14.— *a, c.* Necklaces; *b.* Bead decoration on dress. All from the Thompson Indians.

Thompson River Necklaces

Our first consideration will be the irregularities presented in bead stringing. A string can be threaded with various kinds of beads, and not have a single repetition of arrangement. The necklaces of strung beads will be considered in one group whether they involve loops and fringes or not, for their classification is purely arbitrary. It is more convenient to consider beadwork in the two groups, stringing and embroidery.

Of the thirty-nine objects of the first group, seven show definite irregularities, but of these only two lack a discernible attempt at order.

In the following schemes the small letters indicate small beads, the capitals large beads, and where primes are affixed, shades of the color indicated.

R	red	O	brown
Y	yellow	P	purple
G	green	D	dentalium
B	blue	W	white
A	black		

2 (p. 190). Read from tie at back. One of the two examples where no order whatever is discernible. There are 19 red, 8 green, 10 blue, and 8 yellow beads, all the same size, strung to form a necklace.

3 (p. 190). Beads same as 2. Main string two at a time, the colors corresponding on the two sides for about two-thirds of the distance, then strung at random. Between each pair of beads are fringes consisting of from five to eight beads of the same kind, two of which are paired and similarly placed and two alike but not similarly placed, one being the seventh and the other the ninth from the center loop. The scheme represents half the necklace read from the centre of the front; the letters arranged vertically represent the fringes; the / indicates that from that point on the main string is symmetrical.

4 (p. 190). Necklace of dentalia with beads as in 2, the latter arranged in fringes between the former, only two fringes being alike, one placed at the extreme back of the necklace, the other at the third interval between dentalia. The necklace appears untidy and careless in workmanship.

B B G R R B Y B R B Y G B R R R G R G Y B R R G R Y Y R R R B G R R G R Y R Y B B R Y G R

No. 2.—Necklace, irregular arrangement.

```
R Y G B R Y B Y R G A Y R G B G R/Y Y G G B R R Y Y B B R R G G B B R A A R Y B R . .
          G     B     R     R   B     R   Y   R     G   Y   B Y  G  R   Y
          B     R     R     G   B     R   Y   G     G   Y   B Y  G  R   B
          R     R     R     G   R     G   R   G     B   B   R G  R  Y   B
          Y     R     R     G   R     G   R   B     B   B   R G  R  Y   B
          R     G     B     R   Y     B   G   B     R   R   Y R  Y  B   R
          Y     G     B     R   Y     B   G   Y     R   R   Y R  Y  B
          R     G     B         Y         R   Y         B   R B  G
          B                               R             B   R B  G
```

No. 3.—Necklace with irregular fringe and partly symmetrical main string.

```
D R D R D B G D G D R D R D R Y B B R G G R D B R D Y D B D R D R D R D
  G   Y   Y     Y   P   Y                 R   G     G   G   G   Y   B
  Y   G   G     G   Y   B                 R   G     Y   B   Y   B   G
  B   B   B     B   B   G                 R   G     B   Y   B   R   Y
  R   R   P     P   G   Y                     Y     R   P   R   G   P
                    R
```

No. 4.—Necklace with dentalia and irregular fringe.

5. Fig. 14,*a*. Two strings of beads like those used before and dentalia connected by short horizontal strings of the beads, each beginning with one bead at the back and increasing to four in number in the front. Four of the cross-strings are similarly threaded and similarly placed on either side of a central bead, but there are no others alike. The illustration shows only the central portion of the necklace. Wide hatching represents green, close hatching red, cross hatching blue, solid black black; white represents yellow.

6 (p. 192). Small pale and dark blue, red, light and dark green, brown, yellow, white; and large black, green, red, blue and yellow beads form a necklace of very irregular appearance, but on one side a unit of 18 elements is repeated in reverse order to make symmetrical about one-third of the necklace; only this part will be shown.

7. Beads much like 6, but only small and large green, small and large blue, small red, brown, black, and white used to form bracelet with a clasp. Two units symmetrical with respect to themselves occur, one on each side of a pendant which hangs at a distance of two large and six small beads from one end, and at an interval of one large and fourteen small beads from the other. One symmetrical unit consists of a small red bead with a small green, large green, and small green on each side of it. The other has a large central blue bead and on each side a small blue, a white, and a green bead.

```
gGg r gGg o g a o a gwb B bwg o g r o
          b
          B
          b
          b
          B
```

No. 7.—Bracelet with pendant.

8 (p. 192). Necklace of two strings of small brown, blue, red, and green beads. The inner string perfectly symmetrical from front to back with regard to space filled and number and color of beads. The outer string arranged with bead fringes, five on one side and ten on the other of a fringed, looped pendant. This necklace was

. . . *wywbrwggrAwbwGRBgw|wgBRGwbwaarggwrbwyw*. . . .

No. 6.—Bead necklace with portion symmetrical.

```
b o b o b o b o b o b o b o b r b r b r b r b r b r r b r r b r r b r b r b r b r b r b r b r b r b r b
                              g   g   g   g   g   g       g   g     g   g   g   g   g   g   g   g   g
                              o   r   r   r   r               r     r   r   r   r   r   r   r   r   o
                                  b   b   b   b               b     b   b   b   b   b   b   b   b
                                  o   o   o   o               o     o   o   o   o   o   o   o   o
```

No. 8.—Necklace with regular fringe irregularly placed.

R B R G B G R B R G B G R G R B R B G R B R B G B R G R G B R G B R B G. . .
R Y Y G G B B R R Y Y G G R R A A G G RR Y Y B B G G R R Y Y B B G G R R Y Y B R G G R R G. . .

No. 10.—Necklace of two strings (half only), inner string above, outer string below.

Y BR Y BR Y RBRB Y B Y RB|Y|BR Y R Y BRB Y BR Y BR Y BR

No. 12.—Necklace showing yellow as predominating color.

```
          GG           R         G         R                                   BR           RR          YY           R
      BB     RR   AA    RG   BB   GR    YG   YB   YGRG             GGYB     YG     YG   YY      YB   GG     RR   BB    RG
    R            G          R         B          R        RGYGR           R            B           R            G          R
      G        R   YY   AB   GG   RG    RR   YG    ABRB            BRBG      ARGR        RR     GY   BB     RY    RRBB
         GR           A          R         Y                                                 G           R
```

No. 13.—Necklace with loops.

made irregular purposely because the worker was "told to have it this way in a dream." Only the outer string will be represented.

The question now arises; how much of this irregularity is due to chance? There is little doubt that the maker of 2 had 45 beads and strung them at random, chance decreeing that no repetitions should occur. Necklace 3 shows partial symmetry as evidenced by part of the main string and by the number of fringes, there being fourteen on either side between the back and the central loop pendant. It would hardly be possible to ascribe these features to chance and we must conclude that, regarding design at least, the maker had a definite purpose.

Necklace 5 with its meagre show of regularity is interesting in comparison with a necklace of similar design; viz.,

9. Fig. 14,*c*. Same materials as 5, but dentalia take position of cross-strings of beads. The inner string is perfectly symmetrical, as are the outer loop and the connecting cross strings. The only inconsistency apparent (except two inconsequential mistakes) is that the centers of the inner string and the outer string, including the cross-strings, do not coincide. The result is slightly askew, and may give the impression that no method of construction was used. On the contrary, the necklace may be divided into very complex trapezoidal units (as indicated by the braces), a unit of inner string embracing two units of the outer string elements and the intervening cross strings, with only the lack of central coincidence before mentioned. It is impossible that such a production should be the result of chance and the conclusion is that 5 was an attempt to achieve an elaborate necklace of this style which failed, perhaps because the maker lacked judgment, ability to handle the technique, or thoroughness, or because the attainment of exact symmetry was considered unnecessary or not worth the application it required.

With regard to 3 the same conclusion must be reached, for necklace 10 (p. 192) is made of the same kind of beads combined in two strings with the essential difference that six color combinations consisting of from three to fifteen elements are used on the outer string (including looped pendant which will not be indicated in the scheme) and perfect symmetry is attained on both sides. Six less complex units (of two to five elements) with repetitions form the inner string with as careful symmetrical execution as the outer. In this case the centers are coincident as are also the independent joinings at the back. There is only one error in the whole piece, and that a minor one, i.e., there is only one yellow bead on one side at the back, next to the joining bead, as opposed to two on the other side;—the theme of the outer string is carried out by the use of two beads of each color except in the pendant. Only one half of the necklace will be given since the other half is exactly like it. The red-blue-red combinations of the inner string might be considered as regularly repeated units with irregular separators.

The effect of 6 and 7 is the same and they may be considered together. From both it appears that the large beads set off a section which the worker felt should be symmetrically repeated, but which to her mind had no connection with the rest of the creation. A check on these exists also in the form of bracelet 11 which has the same style but is symmetrical in every respect even including a looped pendant, except for three errors: two blue beads occur on one side as opposed to one on the other, a blue bead takes a position on one side analogous to a brown on the other, and an extra white bead is inserted next to the clasp on one side.

```
                          g G g
w r w b o g o g y b b B b       b B b y g b g o b w r
                          g G g
```

No. 11.—Bracelet with loop.

There is another explanation possible for stringing of this kind, namely limitation of material. Definite information is available in regard to a necklace of strung shells and turquoise owned by Miss Esther Schiff. The necklace was presented to her by Carol Trihillo, a Cochiti Indian girl, who had strung it herself. She had three turquoise beads and a so-called "lucky-stone." The latter must needs be placed at the centre of the string leaving an odd number of turquoises to be distributed on the two sides. Two were strung on one side with six shells between and the third was placed on the opposite side so that if it were placed on the first side the third turquoise would fall exactly midway between the first two.

Perhaps the maker of necklace 6 encountered the same difficulties for she had 9 large beads and many small ones. She probably set out to make a symmetrical whole, discovered that material failed her and strung the rest of the beads in any order. She lacked the foresight exhibited by Carol in planning her necklace, for it would have been possible to form a symmetrical whole had she foreseen the possibility. It must be remembered, however, that her materials, being much more varied, required a higher degree of calculation. Also it is not known at which end she began to work, for had she begun at the other end (i.e., with the small beads) the argument would not hold.

Still another possibility is that the bracelet or necklace was made symmetrically and that beads broke and left the product asymmetrical. In the case of 6, it is hardly probable that as many as six of the large beads would break. Furthermore the small ones that are left are not similarly arranged on both sides of the center.

The same explanation may not be given for 7, for here we have materials which could have been arranged in regular or symmetrical order, as similar ones were in 11, but they were not. This then may be a result of "play with technique." Perhaps a woman saw 11, and, having similar materials, desired to vary the effect, and thus obtained 7 as a result. But, on the other hand. 7 may have preceded 11 in time of execution.

The irregular examples noted and the checks furnished by their regular counterparts urge us to conclude that in general entire lack of purpose is rarely shown.

Three necklaces of a different style from those described are interesting as illustrating the point that symmetry may be necessary in some respects and utterly disregarded in others. These necklaces are formed of small black, red, and white beads threaded in loops between two dentalia. In all three there are, instead of a loop, three beads—red, white, and blue—in the third unit from the back of the necklace, and in the second unit from the front a large bead—in one case green (Fig. 15), in two cases red—is surrounded by small red beads and takes the place of the loops before described. In this illustration the white represents white beads. There is no doubt about the symmetry of these necklaces as the same idea is carried out in all three in precisely the same manner. But the loops of black, white, and red are irregularly threaded, it being almost impossible to find two alike, and the loop-substitutes which form distinctive elements show a peculiar characteristic. In two of the necklaces, the loop on one side is repeated in ***regular*** order (counting from either side) instead of in symmetrical order as might be expected from the rest of the necklace. That is, the unit runs blue, white, red on one side and, reading in the same direction, blue, white, red on the other (see Fig. 15). Our feeling for perfect symmetry would require blue, white, red on one side and red, white, blue on the other. In the third it seems to be necessary to have the three colors present, for on one side we have white, blue, red and on the other red, white, blue. Hence, it may be that as long as the elements are present, their order may be disregarded as well as in the less spectacular loops.

We may say, then, that in these three necklaces there is a definite plan with respect to design and placement of the units, but the order of the elements composing them is immaterial.

Besides the desire to attain symmetrical patterns, and the feeling for exact design, the following necklaces illustrate a third point, i.e., the importance of a single color in definite places regardless of the colors occurring between.

12 (p. 192). Beads same as 2, but none green, strung between two strings of small beads—one blue, the other red.

It will be noticed that there are an equal number of yellow beads equally placed on either side of the central yellow bead with one exception, and the color of the intervening beads is disregarded.

13 (p. 192). Beads same as 2, strung in loops usually two of each color at a time. None of the loops are alike but throughout the necklace the beads which joint the loops correspond on either side of the center loop.

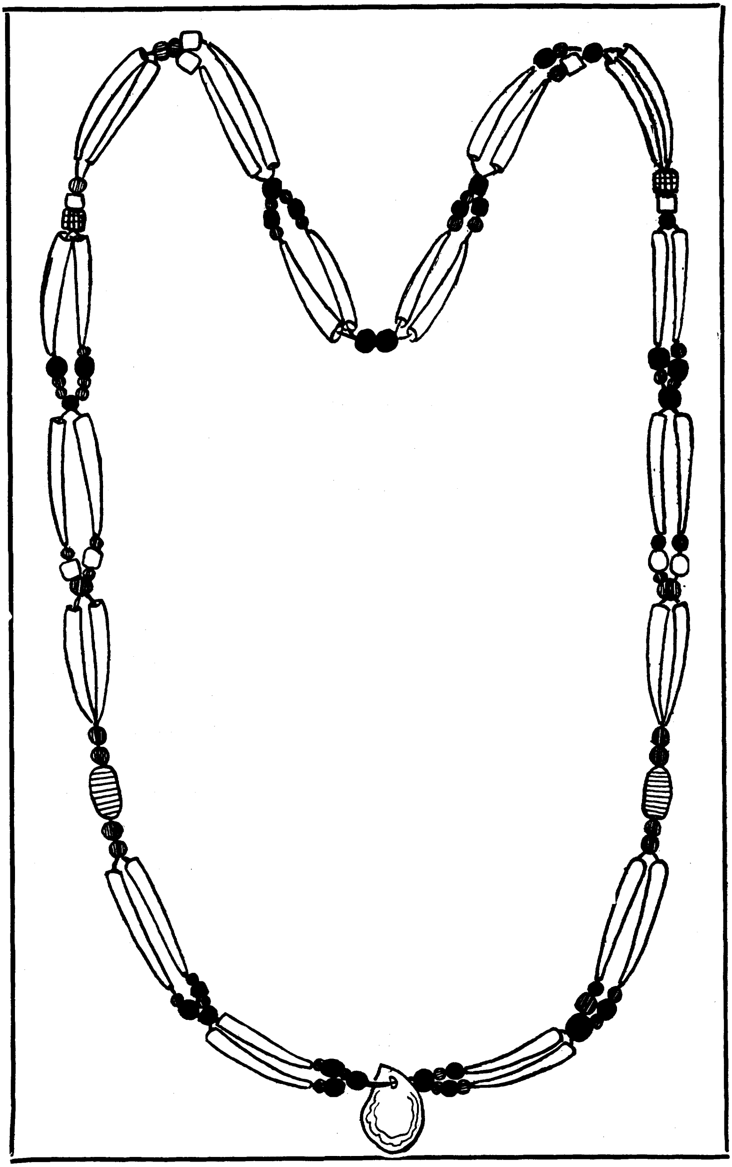

FIG. 15.— Necklace of beads and dentalia (Thompson Indians).

In 14, a double string of beads of the same kind as 2, the design is formed by the arrangement of the red beads:

Y **R** G **R** YG **R** YGB **R** GGG **R** GYBG **R** BYG **R** YG **R** B
B **R** YB **R** GB **R** BG **R** YBG **RRR** YBG **R** BGYG **R** B **R** B **R** B

No. 14.—Necklace in which red is design color.

The following scheme in which the dashes represent colors not red, may bring out the design a little more clearly:

- R - R — R —— R ——— R —— R —— R — R -
- R — R — R — R —— RRR —— R ——— R - R - R -

Another example of this type of work will be given among the stripes embroidered by a member of the same tribe.

Thompson River Wearing Apparel

The effect of bead stringing, looping or fringing is obvious in a necklace or bracelet. But another psychological element is introduced by fringes on wearing apparel such as we find on the sides of bags, pouches, dresses, coats or leggings. It may be granted that exceedingly complex designs on an extended surface may be discerned at a glance by an eye trained or accustomed to see them. But it is utterly impossible that such can be the case with fringes which hang down in a position not at all similar to the one held when they were made.

The fringes on five leggings are regular in stringing and in placing—if the legging or pouch is held so that the fringes fall in the same plane. They consist of sinew, hair, or skin strung with beads alternating with an empty fringe.

Four others become more elaborate, consisting of from two to six elements in the fringe unit, and, finally, 15 shows an exceedingly complex symmetrical arrangement. If the fringes are numbered they read from top to bottom thus:

1 2 3 D 2 1 2 3 2 1 D 2 3 2 1

In this example the fringes of the centre are longer than those on either end but the color scheme is consistently carried out. (See also Teit, The Thompson Indians of British Columbia, Jesup Expedition, Vol. 1, fig. 313). In contrast to the ten regularly fringed leggings, we find only two fringe arrangements irregular. Fringe 16 is on a woman's pouch which shows only a very limited surface and is, therefore, inconclusive. A legging number 17 is trimmed with fringe like necklace 3. It is similar to the necklace in its irregularity also, for only four fringes are alike and they are placed at irregular intervals. The dashes indicate a fringe of hair or sinew.

gg b R bb r b ——
gg bo bo bo bo bo b–
gg r B rr b r ———
Dentalium————
gg bo bo bo bo bo b–
g b R bb r b ———
gg bo bo bo bo bo b –
g r B rr b r ———
g bo bo bo bo bo b —
g b R bb r b ———
Dentalium————
g bo bo bo bo bo b——
g r B rr b r ———
g bo bo bo b ———
g b R b ———

No. 15.—Fringe on legging with complex arrangement.

–bb r bbbb ——
1. –bb r bb r b —
2. –bb r bbbb———
3. –bb r bb r b —
–bb r bb r b —
2. –bb r b r bb ——
1. –bb y b r bb —
2. –bb r b r bb ww
3. –bb r bb r bb ww –
2. –bb r bb r bb www–
1. – bb r bb r bb www–
–bb r bb w b ———
2. –bb r bb r bb ww —
3. –bb w bbb w ———
2. – bbbbbb———
1. —R—
—B——

No. 16.—Fringe on legging with modifications near center.

r
y g bbb rrr
r
g
y gg bb
y
r rr ggg
y
g gg rrr g
y
y
r rr bbb rr
g
b bb ggg
r
g gg rrr g
b
r r ggg rr
y
b bb ggg rr
y
r rr bbb gg
y
g gg rrr
y
b bb
y
r gg r

No. 17.—Fringe on legging irregularly arranged.

In the face of the facts presented by this material we may be almost certain that there is present the element of play, or we might call it desire for variety. The worker perhaps became tired of stringing all the fringes alike and changed one or more of them. If the final result was satisfactory she made bold to make more changes and thus obtained a more complex design, even attaining as elaborate an effect as 15. It is quite possible that she did not realize the rhythmic motive when the work was finished, but only during the process of creating. A flaw in this reasoning is broached by the question, Were the simple fringes made first and did the others follow in the order of greater complexity? Such a question cannot be answered from the mute evidence of the material. But, whatever may be the answer, there can be no doubt that the worker's satisfaction consists of the survey of the work *as made*, and not in the appearance of it *as used*. For the fringes here described, when worn, show absolutely no care in arrangement and appear as an irregular mass of glass and hide.

Thompson River Stripes

Of the twenty-nine embroidered stripes examined, twenty-three show designs of greater or less degree of complexity regularly repeated and need not be discussed here. Seven, however, show characteristics worthy of special notice. Fig. 16,*g* and another stripe are similar in color and plan, consisting of blue, green, white, brown, and yellow spaces each separated by a narrow stripe of silver beads.

In this stripe the close hatching represents brown, the wide hatching green, the cross hatching blue, the heavy stippling yellow, the fine stippling silver and the white white. Fig. 16, *g* is symmetrical except that an extra green element occurs on one side and an additional white one on the other. There are no smaller units comprising the large symmetrical units. The other stripe is perfectly symmetrical except at the center which is marked by a blue diagonal portion on one side and a yellow one on the other.

The colors of another stripe are regularly repeated in a five-element design but the spaces filled differ in size. Fig. 16, *h* is composed of the same colors, namely, red (close hatching), black, blue, and yellow, but the units are not all alike. The black-yellow-blue-red-blue unit is used twice; then two larger spaces are filled with a black-yellow-red-blue-red-blue motive and the stripe is finished by two black-yellow-blue units. The second

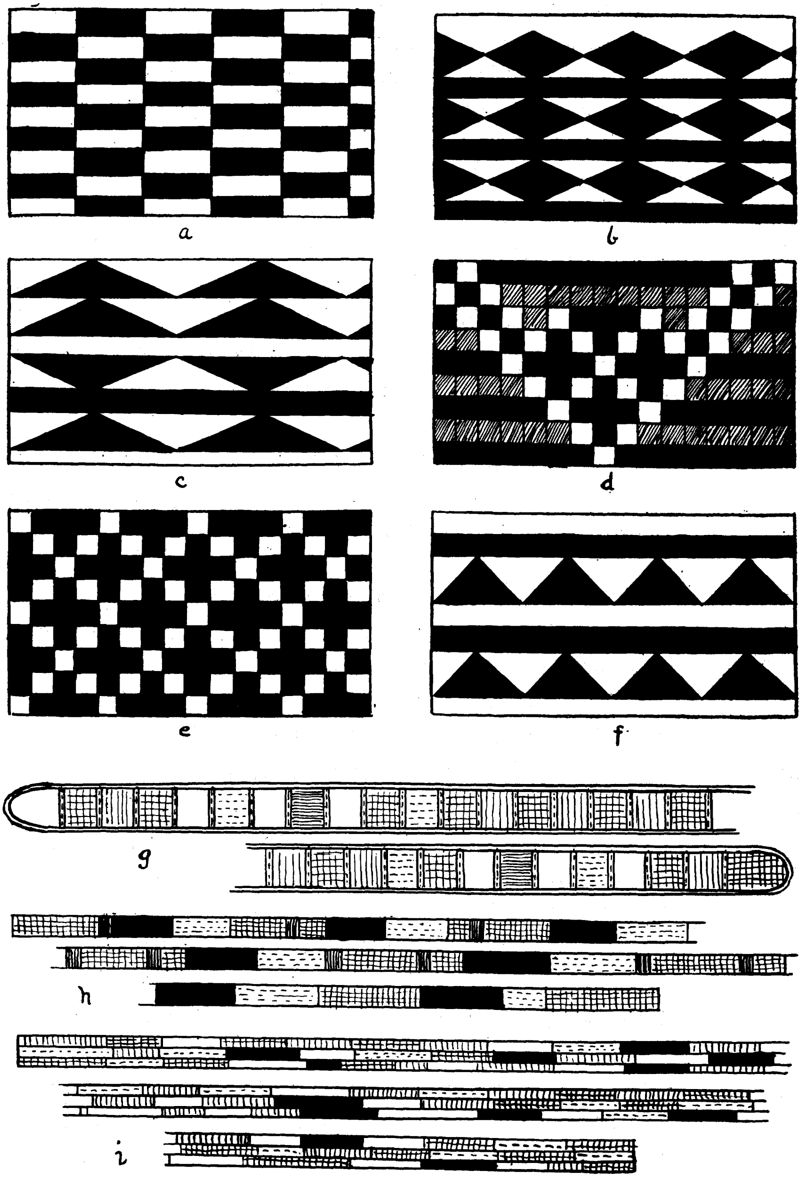

FIG. 16.— *a-f*. Designs on Siberian coat-bands; *g-i*. Stripes on Thompson Indian dresses.

design appears like an extension of the first as a space-filler, but the extra, as well as the original, red and blue elements are subtracted from the two final motives. Or conversely, the stripe may have been begun with the blue-yellow-black unit, and the others may be a gradual elaboration of the end unit. This explanation seems to me more reasonable, for such designs are usually begun at the end and worked inward. There is no doubt, however, that the arrangement with the introduced variations is far more effective than without them as in the preceding stripe. Here it is quite possible that the artist played with her materials, probably not realizing what the effect of the finished product would be.

Three stripes made by the same worker show interesting variations.

Fig. 16, *i* consists of three rows or stripes, each composed of narrow (about ⅛ inch) elements of blue, green, yellow, white, and black embroidery, placed one above the other. The same color may overlap in two of the three rows but never exactly corresponds. There is no regularity or symmetry noticeable except that the blue elements are grouped at the ends leaving the central portion yellow, white, black, and green.

A companion stripe omits the blue elements, but introduces spaces composed of silver beads. The colors of this stripe are arranged in two rows. If there is any regularity it is not apparent, although the effect is more than pleasing.

Stripe 18 is very similar to Fig. 16, *i* but much simpler. It is a single stripe, there are no silver beads and the key color is yellow, i.e., there are three spaces filled with other colors, followed by one yellow which alternates with another color—black, green, or white—for six spaces and then the scheme is repeated, the whole stripe appearing graphically as follows (the dashes represent colors not yellow):

—— y - y - y - y —— y - y - y —— y - y - y —— y - y - y —— y - y - y -

The stripes described, except Fig. 16, *h* and its simpler counterpart were made by Sinsintko and her daughter TEkwitkixkEn. Since there are numerous examples of perfectly rhythmic stripes made by them, and since they combine peculiar color effects such as these even in making representative designs (as evidenced by a note of Mr. Teit) it is almost conclusive to say that they play with their materials. As they have attained a high degree of virtuosity, the result of their play is satisfactory, not only to themselves but also to others not accustomed to their style. In 18 we have another very good example of the importance of a predominating color such as that presented in necklaces 12, 13, and 14.

The Coat-Bands of the Russianized Natives of Siberia

a. DESIGN

There remain for discussion the borders on the fur coats of the Russianized Natives of Siberia. It will be recalled that only the embroidered central portion of these borders has been analyzed. The surrounding stripes are simple in decoration and need not be discussed. The designs consist of combinations of rectilinear geometric designs as illustrated, Fig. 16, *a*, *b*, *c*, *d*, *e*, and *f*. The light and dark spaces indicated represent contrasting colors which may not mean that only two shades are used in the design; more may occur. Such a representation makes clear the design feature as opposed to the color motives. Only by considering the two independently has it been possible to reach the solution of the problem as presented by these borders. By the introduction of a number of colors (sometimes as many as five) the designs *d* and *e* assume a slightly different aspect, but fundamentally the illustrations are typical.

Each of the borders 70/5736 and 70/5735 (catalogue numbers of the bands in the American Museum) consists of twenty-four elements.

70/5735, the simpler in design, consists of a unit composed of elements *c*, *a*, *b*, *d* repeated six times in the same order.

The elements of 70/5736 are arranged in this order:

d ca(bdc) e(cdc)a (bdc) a(cdb)e (cdb)ac

It will be observed that the band is symmetrical on each side of the small unit (bdc) except for one error on each side; (bdc) or its reverse (cdb) will be recognized also as a part of the larger symmetrical unit as indicated by the parentheses. The central unit (bdc) is either the front or the back of the border. Judging from the position of a similar band on coat 70/6999 it is the front. If such is the case the irregularities occur under the arms. This phenomenon corresponds with that observed by Jochelson on the Koryak robes, and there has doubtless been influence in either direction, that is, from Koryak to Russianized natives, and vice versa.

Borders 70/7831 and 70/6999 consist of twenty-two elements, the latter being simpler in arrangement:

dbaf dbaf af dbaf dbaf dbaf

Here is complete regularity except where the two extra designs meet in the front where only half the design *fa* is used.

The design plan of 70/7831 may be represented thus:

```
 1     2     1     1     2
bdfa  bdca  bdfa  bdfa  bdca  bd
```

The arrangement, consisting of two units of four elements each, is self-evident.

There is room for little doubt as to the design plan of these bands. There are no definite rules regarding the size of the elements, but their place in the band seems fixed beyond dispute, since all show the same consistency in arrangement.

We do not, however, encounter the same consistency in the

b. COLOR COMBINATIONS

Among the Thompson Indians there was very little evidence (and that was scarcely tenable) that green was confused with blue or yellow. Discrimination was always made at least between the ordinary colors—blue, green, yellow, red, black, and white. Even purple and brown appear to be carefully differentiated. However, there was not such variety of color found in the beads used by them as we find in the embroidery flosses imported by the Russianized natives. They use every shade and tint of all the usual colors which they can procure. They know that blue and green are different, for both may be used in the same design. If they considered the two colors as one there would be no design formed. But on the other hand, blue and green may be used indiscriminately if only one is needed. For example, there would be no hesitancy in using blue to complete a design begun in green if material of the latter color became exhausted. A medium tint of purple, too light for purple, too dark for lavender, is classed in the blue-green category. Dark shades of blue, green, brown, and red may be used instead of purple or black, and in one case a brilliant orange appears to take the place of red. Besides these classifications yellow and pink may be interchanged. From such observations, then, it may be inferred that the most important aim is to effect a contrast, although there is no inability to detect differences in color, but merely a mode of classification differing from ours. In other words, there is a color feeling, but no differentiation between color, shades, and tints.

Observers of the neighbors of the Russianized natives confirm these remarks in general. Middendorff (quoted by Ratzel, *History of Mankind*, II, p. 213) says the Tungus were able to distinguish tints only after long pondering. Ratzel (ibid.), in speaking of the Lapps, believes that the difficulty is not one of inability to distinguish but lack of vocabulary for expression. Jochelson gives the Koryak color terminology which agrees fundamentally with that displayed by the specimens under discussion. At any rate the limitations of vocabulary are confirmed by the psychology presented in working out the design.

With these qualifications, then, we may present the results obtained by a careful analysis of color use on the coat borders. In all of the bands the odd places are occupied by two-color combinations, these being with very few exceptions blue-yellow and red-blue. I have been able to discover no regularity in arrangement of these combinations. We may perhaps consider them as separators, and proceed to an investigation of the method of filling the even places. The following groups are general indications of the combinations. (It must be remembered that every imaginable shade or tint may be used for any one of the colors specified.)

(t) = blue, white, black.
(x) = white, yellow, purple.
(y) = red, white, purple (black, brown, blue, green)
(z) = red, white, yellow, dark shade of blue, black or red

The arrangement may now be represented graphically for the four bands, i.e., the filling of the even places.

70/5735

Places	2,	4,	6,	8,	10,	12,	14,	16,	18,	20,	22,	24,
Combinations	z	y	z	x	z	y	z	x	z	y	z	x

70/5736

Places	2,	4,	6,	8,	10,	12,	14,	16,	18,	20,	22,	24,
Combinations	s	y	y	?	s	y	y	y	s	y	y	y

70/6999

Places	2,	4,	6,	8,	10,	12,	14,	16,	18,	20,	22,
Combinations	y	y	y	y	y	y	y	y	y	y	y

70/7831

Places	2,	4,	6,	8,	10,	12,	14,	16,	18,	20,	22,
Combinations	y	y	z (y)	y	z	t	x	y	y	t	y

It is hardly necessary to point out the rhythmic repetitions of 70/5735 and 70/5736; they are very obvious; 70/6999 does not, by any means, give the appearance of the consistency shown in this classification because of the very great differences in tint and shade of flosses used. 70/7831 appears unplanned and careless although in reality the effect is quite as good as in the others, since even in the most elaborate ones, the arrangement is not apparent and can be discerned only after the most detailed scrutiny.

Such complications as are shown by these bands could not have been the result of play, especially when we realize that they have been achieved simultaneously with the complexities of design before noted. Finally we must remember that the separating elements which fill the odd places further complicate the effect. 70/6999 has eliminated one source of complexity by keeping all the even places filled by the same, or approximately the same, combinations. The last border, 70/7831, fails to present any well-defined plan, whether the odd places or the even are considered, or even if the two are taken together. It may be well to recall, however, that in this band the design symmetry, while not quite as elaborate as 70/5736, is more perfectly carried out.

Generally speaking, these bands show that where the greater complexity of design is found the simpler becomes the color arrangements, and conversely, but in each case perfection in design predominates.

It is my opinion that these bands must have been carefully planned before they were made, and where the worker was skilled in the art of calculation and possessed judgment with regard to space and proportion the results are products almost phenomenal in execution. Where the worker had attained a smaller degree of virtuosity the result suffered either in becoming more simple or in being inaccurate. This inaccuracy shows itself in the display of the color alone, whereas the design remains symmetrical with few errors. The adaptation to the working surface has been secured by lengthening or shortening the design elements rather than by changing their number, for there is no regularity in their size.

Origin of Modern Styles

We have had brought to our attention the results of primitive craft; the question of origin is now relevant. To get at the root of this query we knew of no method except an attempt to explain the styles of our own civilization. Mr. Crawford pointed out a conclusion which we had drawn from the observations given above, namely, that the world's *creators* in any art could be counted for the most part on the fingers of one hand. It is estimated that for every dress, coat, or hat which "takes" with the best-dressed women, fifty have been submitted for approval and summarily discarded. But of all the many presented for criticism, only rarely does one production appear which is actually unique. All the rest are adaptations of what has gone before—play with the technique.

The source of the original ideas is as elusive as the temperamentality of the great audience which adopts or discards them. Their innovators say they are due to "inspiration," our primitive friends "see them in a dream," and that is as far as we get. We know, however, that behind the inspiration or dream is the desire to please and it may be satisfied by the deliberate execution of symmetry or regularity as well as by purposeful departure therefrom. The satisfaction obtained in the irregularity of a Thompson River stripe may be as great as that secured by using one shoulder band of velvet and one of flowers to support the bodice of an evening gown. And as long as the aim is attained it matters little what means are used to achieve it.

CONCLUSION

The specimens examined and analyzed give undisputed evidence of the desire to achieve a satisfactory effect. The few departures from the attainment of it are due to lack of perspective, limitation of material, carelessness, or failure to acquire virtuosity in the use of the technique.

It is very common to find symmetry or regularity, but both occur more often in execution of design than in color. Satisfaction is found quite as often in variety as in regularity and much variation is secured by extending units to a high degree of complexity or by preserving design and simultaneously changing color. One color sometimes predominates and the others perform the rôle of space-fillers, their colors being unimportant.

There are few creators and many imitators; the latter secure their effects by adapting their materials and the use of them to the designs furnished by the innovators they are following. They, too, have a desire for change and find it, not through inspiration or dreams, but by experimentation or play with materials and method. In some cases, the whole creation must be visualized before it is begun, and the results of such foresight are shown by great complexity.

In drawing these conclusions we are limited by the scantiness of our acquaintance with the chronology and with the makers of the art forms. To overcome these limitations we suggest that specimens from other areas be examined, that artists be interviewed with regard to motives whenever possible, that examples of known authorship be analyzed, and, if possible, the time of manufacture with respect to other results of the same worker be ascertained. In this way the worker's motives may be discovered and also the relative occurrence of simplicity or complexity.

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